

REMARKS

Claims 1 and 2 have been amended to define further and more fully certain novel and distinguishing features of the invention. Conforming amendments have been made as necessary in the other dependent claims (specifically, in claims 5, 18 - 20 and 24 - 26). New claims 27 and 28 have been added, to provide protection for applicants' disclosed inventive method. Since the present Amendment does not increase either the total number of claims or the number of independent claims (beyond that previously paid for), no additional fee is necessary.

Claims 1 (independent; product), 2, 5, 16, 18 - 26 (all dependent on 1), 27 (independent; new; method) and 28 (dependent on 27) are in the application. No claim has been allowed.

Rejection under §112

In response to the rejection of claims 1, 2, 5, 16 and 18 - 26 under 35 U.S.C. §112, second paragraph, as indefinite, claim 1 has been revised to set forth the ventilation resistance range as a property of the claimed laminated sheet. It is clear that in the amended claim, this range is not recited as a limitation on scattering of powder. Thereby, applicants submit, the rejection is fully and self-evidently overcome, with respect to both independent claim 1 and dependent claims 2, 5, 16 and 18 - 26.

Rejection under §103(a)

With reference to the rejection of claim 1 under 35 U.S.C. §103(a) as unpatentable over WO 02/038374 (Ogawa WO '374, as translated in U.S. Pub. No. 2004/0100125) in view of U.S. patent No. 6,291,068 (Wang) and U.S. patent application publication No. 2004/0053003 (Coates), it may initially be noted that claim 1 has been amended to recite that the fiber sheet and porous material

"are bound together by spraying a water dispersion of fire retardant capsules on a side of said fiber sheet, putting said fiber sheet on said porous material in a

manner such that the sprayed side of said fiber sheet contacts said porous material and pressing the resultant laminated sheet with heating."

In addition, dependent claim 2 has been amended to recite that "a hot melt adhesive powder is mixed in said water dispersion of said fire retardant capsules." These added recitals are supported by the disclosure of the original application e.g. in Example 3 at pp. 33-34 (water dispersion of fire retardant capsules), and in Examples 7, 8, 9, 10 and 13 at pp. 39-42 and 43-45 (water dispersion of fire retardant capsules and a hot melt adhesive powder).

In the case where a synthetic resin solution is impregnated in a fiber sheet, generally, the resulting fiber sheet in which the synthetic resin solution is impregnated is squeezed by the squeezing roll to adjust the impregnating amount of the synthetic resin in the fiber sheet. If fire retardant capsules are mixed in the synthetic resin solution, the fire retardant capsules may be partially washed away from the fiber sheet during squeezing so that the excellent fire retardancy can not be guaranteed.

To solve the above described problem, in amended claim 1, a water dispersion of said fire retardant capsules is prepared and after the synthetic resin solution is impregnated in the fiber sheet, the water dispersion is sprayed on said fiber sheet. In a case where a hot melt adhesive powder is used to bond between the fiber sheet and the porous material, the hot melt adhesive powder is mixed in the water dispersion of said fire retardant capsules, as now recited in amended claim 2.

These features result in an improved product, by overcoming the aforementioned problem which derogates from desired product properties; hence, their recitals are properly entitled to weight as limitations in product claims.

Coates discloses a thermoformable acoustic sheet formed by a compressed fibrous web including high melt and adhesive thermoplastic fiber and the thermoformable acoustic sheet has a total air flow resistance between 600 and 1100 mks (claim 5), and further the hot melt fiber has flame retardant characteristics (claim 24). Nevertheless, Coates does not disclose use of a water dispersion of fire retardant capsules or fire retardant capsules and hot melt adhesive powder, and further spraying the water dispersion after the synthetic resin solution is impregnated in said fiber sheet, as now recited in applicants' amended claim 1. Ogawa discloses an interior material

comprising a porous base and a nonwoven fabric in which a sulfomethylated and/or sulfimethylated phenolic resin is impregnated. Nevertheless, Ogawa does not disclose a water dispersion of fire retardant capsules which is sprayed on the nonwoven fabric after the phenolic resin is impregnated in the nonwoven fabric. Wang discloses fire retardant capsules and the fire retardant capsules are used for such as electric and electronic parts, materials for motorcars, and construction materials. Nevertheless, Wang does not disclose use of a water dispersion of fire retardant capsules or fire retardant capsules and a hot melt adhesive powder, and further spraying the water dispersion after the synthetic resin solution is impregnated in the fiber sheet.

Thus, none of the references applied against claim 1 discloses the features discussed above and introduced by the present Amendment, defining the new and improved product of applicants' invention. It follows that no combination of the applied references could suggest or make obvious those features, and that the recital thereof distinguishes amended claim 1 patentably over Ogawa, Wang and Coates, taken together. Claims 2, 5, 16, 18 - 21 and 23 - 26 distinguish in like manner over the same references by virtue of their dependence on claim 1. U.S. patent No. 6,362,269 (Ishihata) applied in the rejection of claim 2, and U.S patent No. 5,188,896 (Suh) applied in the rejection of claim 5, are not seen to supply what is lacking in Ogawa, Wang and Coates respecting the novel and distinguishing features of claim 1 as herein amended.

The New Claims

New claims 27 and 28 are directed to methods of making the fire resistant laminated sheet of claims 1 and 2, including binding the fiber sheet and the porous material together by the steps of spraying a water dispersion of fire retardant capsules on a side of said fiber sheet, putting said fiber sheet on said porous material in a manner such that the sprayed side of said fiber sheet contacts said porous material and pressing the resultant laminated sheet with heating. These claims are supported by the original disclosure in the same manner as the above-discussed amendments to claims 1 and 2 and are submitted to distinguish patentably over the applied references, however combined, in the same way as amended claims 1 and 2.

For the foregoing reasons, it is believed that this Amendment will place the application in condition for immediate allowance. Entry of the Amendment, and favorable action, are accordingly courteously requested.

Respectfully,

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I hereby certify that this paper is being deposited this date with the U.S. Postal Service as first class mail addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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